

**Claims**

What is claimed is:

- 5                   1. A method of manufacturing optical fiber preform comprising the steps  
                    of:

                    forming a continuous supply of core cane,  
                    grasping and imparting rotational motion to the core cane with a feed  
                    apparatus, and  
10                   depositing soot onto the core in a deposition chamber to form a soot  
                    preform.

                    2. The method of claim 1 further comprising a step of consolidating  
                    the soot preform in a consolidation chamber longitudinally aligned with  
                    the deposition chamber thereby vitrifying the soot preform into a  
15                   consolidated preform.

                    3. The method of claim 1 further comprising a step of dehydrating the  
                    soot preform in a drying chamber longitudinally aligned with the  
                    deposition chamber prior to the step of consolidating.  
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                    4. The method of claim 1 further comprising a step of forming the  
                    preform to be of substantially constant diameter.

                    5. The method of claim 1 further comprising a step of cleaning a  
25                   periphery of the core prior to depositing.

                    6. The method of claim 4 wherein the step of cleaning further  
                    comprises passing the core through an apparatus that imparts a wiping  
                    action.  
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                    7. The method of claim 1 wherein the step of depositing soot is  
                    accomplished by using a plurality of longitudinally spaced burners.

8. The method of claim 1 wherein the step of depositing soot is accomplished by burners positioned at points along the longitudinal axis of the core cane.

9. The method of claim 1 wherein the step of forming a continuous supply of core cane comprises welding together a plurality of core cane segments.

10. The method of claim 1 wherein the step of depositing soot is accomplished by at least two spaced burners positioned non-equidistant from a longitudinal axis of the core cane.

11. The method of claim 10 wherein the spaced burners are oriented to apply soot in a direction substantially perpendicular to the longitudinal axis of the core cane.

12. The method of claim 1 wherein during the step of depositing soot, soot is applied in amounts that increase linearly along the longitudinal axis of the core cane within the deposition chamber.

13. An optical fiber preform manufacturing apparatus, comprising:  
a downfeeder providing a continuous supply of core cane, the  
downfeeder grasping and imparting movement to the core cane,  
and  
a deposition chamber, including at least one burner, in which soot is  
deposited onto the core cane to form an optical fiber soot preform.

14. The apparatus of claim 13 further comprising:  
a drying chamber in which the soot preform is dried, the drying chamber  
being longitudinally aligned with the deposition chamber.

15. The apparatus of claim 13 further comprising a consolidation chamber in which the soot preform is vitrified to form a consolidated preform, the consolidation chamber being longitudinally aligned with the deposition chamber.

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16. The apparatus of claim 13 further comprising a cleaner operative to clean a periphery of the core cane.

17. The apparatus of claim 13 further comprising a first diameter measurer to measure a diameter of the soot preform.

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18. The apparatus of claim 17 further comprising a second diameter measurer to measure a diameter of the soot preform at a different position than that the first diameter measurer.

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19. The apparatus of claim 13 further comprising spaced burners oriented to apply soot in a direction substantially perpendicular to a longitudinal axis of the core cane.

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20. The apparatus of claim 13 further comprising at least one environmental seal positioned between respective chambers.

21. An optical fiber manufacturing apparatus, comprising:  
a downfeed apparatus grasping a continuous supply of core cane and  
imparting translational and rotational motion to the core cane,  
a walled deposition chamber, including at least one burner, in which  
soot is deposited onto the core cane to form a soot preform,  
at least one chamber longitudinally aligned with the deposition  
chamber in which the soot preform is vitrified and melted to form a  
tapered end, and  
a drawing mechanism to draw an optical fiber from the tapered end.

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22. An optical fiber manufacturing apparatus, comprising:

a deposition chamber in which soot is deposited onto a core cane to form a soot preform portion,

a consolidation chamber in which the soot preform portion is  
5 vitrified to form a consolidated preform portion, and

a draw chamber melting the consolidated preform portion such that  
an optical fiber may be drawn therefrom, wherein each chamber is  
longitudinally aligned with an adjacent one of the chambers and at least  
one environmental seal is positioned between each of the chambers to  
10 minimize gas flow between respective adjacent chambers.

23. An optical fiber manufacturing apparatus, comprising:

a longitudinally traversing supply of continuous core cane, and

a deposition stage, including a plurality of burners positioned at  
15 different distances from a longitudinal axis of the core cane, to apply soot  
at longitudinal intervals thereby forming a soot preform.

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